

Appln. No.: 10/619,115
Amendment Dated June 2, 2005
Reply to Office Action of March 3, 2005

MKPA-105US

Remarks/Arguments:

Claims 1-26 are pending. Claims 1 and 3-6 are cancelled. Claims 2, 7 and 24 have been amended. No new matter is introduced therein.

Claim 24 was objected to as lacking proper antecedent basis. In particular the phrase "the aperture" has been found to lack antecedent basis. Claim 24 has been amended accordingly and applicant requests that the objection to the claim be withdrawn.

Claims 1, 3 and 4 were rejected under 35 U.S.C. §102(e) as being anticipated by Zairi et al (U.S. Pat. App. Pub. No. 2003/0108304). Claims 1, 3 and 4 have been cancelled.

Claim 13 was rejected under 35 U.S.C. §102(b) as being anticipated by Ahn et al. (U.S. Pat. No. 5,570,385). This ground for rejection is respectfully traversed. In particular, Ahn et al. do not disclose nor suggest:

... a substrate ... having an optical component region and a substantially planar fiber mount region adjacent to the optical component region ..." as required by claim 13.

Ahn et al. disclose a semiconductor laser formed of a compound semiconductor substrate having a laser chip region and a guide region. Ahn et al. disclose coupling the laser with an external signal transfer line (col. 7, lines 25-28) using a "guide region." As shown in Fig. 6i, the guide regions are U-shaped, not "substantially planar" as required by claim 13. While Fig. 7i appears to show a planar guide region, this is an improper reading of the figure as Figs. 7a through 7i merely show details of a portion "L" of the device shown in Figs. 6a through 6i. (See col. 5, lines 17, 46, 53 and 64 as well as col. 6, lines 13, 41 and 46). Ahn et al. require the "guide region" to be U-shaped because the optical fiber is attached to the device by covering the optical fiber in the guide region and the optical device with an epoxy resin "to prevent laser beam losses." (See col. 3, lines 8-15). If the guide region were planar instead of being U-shaped, the epoxy would not properly cover both the fiber and the laser, allowing some light leakage. In addition, because the contour onto which the epoxy is placed would not be substantially flat, the epoxy would need to be heated to a higher temperature in order to conform to the contour. This would allow the epoxy to undesirably flow between the end of the optical fiber and the laser, interfering with the optical coupling. Because the guide region is U-shaped, the epoxy above the optical fiber is on the same level as the top of the optical device

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and can attach the fiber to the optical device without flowing between the fiber and the optical device.

The present invention provides other advantages over the Ahn et al. reference by having a "substantially planar fiber mount region." In particular, the planar fiber mount region allows the optical fiber to be aligned with the optical device. If, for example, the laser emits light more toward one side than the other, or if the optical fiber has a defect that narrows the region into which light may be propagated, the device described by Ahn et al. would produce a poor coupling while the device of the present invention could still produce a good coupling as the optical fiber may be positioned in at least two dimensions in order to achieve the best coupling. Because Ahn et al. does not disclose nor suggest all of the limitations of claim 13, claim 13 is not subject to rejection under 35 U.S.C. §102(b) as being anticipated by Ahn et al.

Claims 2, 5 and 6 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Zairi et al. Claims 5 and 6 have been canceled. Claim 2 has been amended to depend from claim 7.

Because amended claim 2 depends from claim 7, it is not subject to rejection under 35 U.S.C. §103(a) as being unpatentable over Zairi et al. for at least the reasons discussed below with regard to claim 7.

Claims 7-12, 18-20 and 24-26 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Zairi et al. in view of Tombling et al. (U.S. Pat. No. 6,728,450). Claim 7 has been amended so that it recites, in part:

... a substrate having an optical component mount aperture formed therein and a substantially planar fiber mount region formed on the substrate and adjacent to the optical component mount aperture, wherein the optical component mount aperture is configured to receive an optical component therein ...

The added phrase is supported by, for example, paragraph 40, and Figure 2.

Zairi et al. disclose an optical connection module that includes a substrate 92, thermally insulating material 94 and a bonding pad 96 attached to the insulating material 94 (paragraph 36). Zairi et al. discloses mounting a laser directly on the substrate or attachment using a bonding region (paragraph 36). Zairi et al. does not disclose nor suggest "a substrate having an optical component mount aperture formed therein and a ... fiber mount region formed on the

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substrate, ... the optical component mount aperture is configured to receive an optical component therein ..." (emphasis added). Zairi et al. does not disclose nor suggest a substrate does not disclose nor suggest a substrate having a fiber mount region and a component mount aperture that is configured to receive an optical component mounted in the fiber mount region.

Tombling et al. disclose a support surface 36 containing apertures 52. Contact pads 53 and electrodes 51 are placed in the apertures and optical component 31 is mounted on top of the substrate. (See Fig. 10 and col. 6, lines 4-13). Tombling et al. does not disclose nor suggest "a substrate having an optical component mount aperture formed therein and a ... fiber mount region formed on the substrate, ... the optical component mount aperture is configured to receive an optical component therein ..." (emphasis added). Tombling et al. does not disclose or suggest a substrate having a fiber mount region and a component mount aperture that is configured to receive an optical component mounted in the aperture as required by amended claim 7. The present invention provides an advantage over Tombling et al. because the optical component is placed within the aperture to provide stability when the optical fiber is aligned with the optical component. Tombling et al. do not provide this advantage.

Accordingly, neither Zairi et al. nor Tombling et al. disclose nor suggest Applicant's features as required by amended claim 7. In view of the amendment to claim 7, it is not subject to rejection under 35 U.S.C. §103(a) as being unpatentable over Zairi et al. in view of Tombling et al. Claim 8 has been amended to be consistent with the changes made to claim 7. Because claims 8-12 depend from claim 7, they are also not subject to rejection under 35 U.S.C. §103(a) as being unpatentable over Zairi et al. in view of Tombling et al.

The ground for rejection of claim 18 is respectfully overcome by the amendment to claim 18 for similar reasons to claim 7. As set forth above, neither Zairi et al. nor Tombling et al. disclose nor suggest:

...forming an optical component mountable aperture on a surface of the substrate; ...forming a ... fiber mount region on a surface of the ... substrate and adjacent to the optical component mountable aperture; ...placing an optical component within the optical component mountable aperture...

as required by claim 18.

Neither Zairi et al. nor Tombling et al. disclose nor suggest forming a substrate having a fiber mount region and placing an optical component within an optical component mountable

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aperture. Accordingly, claim 18 is not subject to rejection under 35 U.S.C. §103(a) as being unpatentable over Zairi et al. in view of Tombling et al. Because claims 19-20 depend upon claim 18, they are also not subject to rejection under 35 U.S.C. §103(a) as being unpatentable over Zairi et al. in view of Tombling et al.

The ground for rejection of claim 24 is overcome by amending it in a manner similar to claim 7. As set forth above, neither Zairi et al. nor Tombling et al. disclose nor suggest "... an unpackaged optical component mounted on the base in an aperture...." as required by claim 24. Accordingly, claim 24 is not subject to rejection under 35 U.S.C. §103(a) as being unpatentable over Zairi et al. in view of Tombling et al. Because claims 25 and 26 depend upon claim 24, they are also not subject to rejection under 35 U.S.C. §103(a) as being unpatentable over Zairi et al. in view of Tombling et al.

Claims 14-17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ahn et al. and further in view of Zairi et al. This ground for rejection is respectfully traversed. Ahn et al. and Zairi et al. are discussed above. As set forth above, claim 13, from which claims 14-17 depend, is not subject to rejection under 35 U.S.C. § 102 or 103 in view of Ahn et al. One of ordinary skill in the art would not combine Ahn et al. with Zairi et al. to use the fiber mount region of Zairi et al. with the optical device of Ahn et al. because to do so would change the principle of operation of Ahn et al.

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.¹

As described above, Ahn et al. use a U-shaped guide region to hold the optical fiber so that the optical fiber and the laser can be covered with epoxy. If a mount region such as is disclosed by Zairi et al. were used with the optical device described by Ahn et al., either the epoxy would not properly cover both the fiber and the device or it would flow between the fiber and the device, interfering with the optical coupling. Thus, claim 13 is not subject to rejection under 35 U.S.C. § 103 in view of Ahn et al. and Zairi et al. and claims 14-17 which depend from claim 13 are also not subject to rejection under 35 U.S.C. §103(a) in view of Ahn et al. and Zairi et al.

¹ MPEP §2143.02 quoting *In re Ratti*, 123 USPQ 349 270 F.2d 810 (CCPA 1959)

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Claim 21 was rejected under 35 U.S.C. §103(a) as being unpatentable over Ahn et al. in view of Doussiere et al. (U.S. Pat. No. 5,717,711). This ground for rejection is respectfully traversed. In particular, neither Ahn et al. nor Doussiere et al. disclose nor suggest:

A method for forming a fiber-coupled optical component ... forming a substantially planar fiber mount region on a surface of the substrate ... as required by claim 21.

As described above, Ahn et al. do not disclose forming a substantially planar fiber mount region on a surface of the substrate. Doussiere et al. disclose a fiber laser coupler. Doussiere et al. do not disclose nor suggest forming a fiber mount region on a surface of the substrate. Instead, Doussiere et al. disclose a fiber mounted in an opening in the wall of a casing that encloses the optical device. (See Fig. 3 and col. 3, lines 54-60). Accordingly, Doussiere et al. do not provide the material that is missing from Ahn et al. Consequently, claim 21 is not subject to rejection under 35 U.S.C. §103(a) as being unpatentable over Ahn et al. in view of Doussiere et al.

Claims 22 and 23 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ahn et al. in view of Doussiere et al. and further in view of Zairi et al. This ground for rejection is respectfully traversed. Ahn et al. and Doussiere et al. are described above. As set forth above, Zairi et al. can not be combined with Ahn et al. to produce the subject invention. Because claims 22 and 23 depend from claim 21 they are not subject to rejection under 35 U.S.C. §103(a) as being unpatentable over Ahn et al. in view of Doussiere et al. and further in view of Zairi et al.

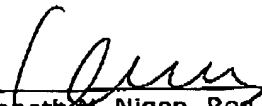
In view of the foregoing amendments and remarks, Applicant requests that the Examiner reconsider and withdraw the rejection of claim 2 and 7-26. The prior art made of record but not applied has been considered but does not affect the patentability of any claim.

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The examiner's attention is directed to co-pending application no. 10/606,606 entitled LOW COST PACKAGE DESIGN FOR FIBER COUPLED OPTICAL COMPONENT, having the same inventorship, and being assigned to the same assignee as the subject invention.

Respectfully submitted,


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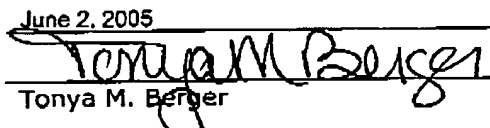
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June 2, 2005


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